

THE EARLY STAGES OF *PARORNIX FINITIMELLA* 53
(ZELLER) AND *P. TORQUILLELLA* (ZELLER)
(LEPIDOPTERA:GRACILLARIIDAE)

By A. M. EMMET*

Parornix torquillella was placed on the British list in the same year as that in which it received its name in Germany (Stainton, 1850). Later Stainton (1864) gave a full and accurate account of its early stages. He described it as bivoltine flying in May and August, but with reservations, since he had taken the adult in July and adults from July larvae had not emerged until the following year. Morris (1872), Meyrick (1928) and Ford (1949) all treated the moth as bivoltine, ignoring Stainton's uncertainty.

Parornix finitimella was named and described in the same paper as *P. torquillella* (Zeller, 1850). Although Stainton (1850; 1864) made reference to it, he did not include it as a British species. However, he stated that he had reared an *Ornix* [*Parornix*] from sloe which was not *P. torquillella* (1864: 296). He tentatively determined these moths as the *Crataegus*-feeding *P. anglicella* (Stainton), but added that they should possibly be referred to *P. finitimella*, a supposition we can now tell to have been correct. Neither he nor any other contemporary British entomologist followed up this hint and more than half a century was to pass before this common species was confirmed as occurring in this country.

When this happened, its recognition by Pierce (1917) was only a chance by-product of his work on the genitalia of the Geometridae. In this study he was helped by the Revd. C. R. N. Burrows who was vicar of Mucking, an Essex hamlet on the Thames estuary. Pierce used to stay with Burrows and the two entomologists were struck by the number of interesting microlepidoptera in the area. Burrows, however, was only a macrolepidopterist and could not determine them. Accordingly, Pierce suggested that Burrows should make a collection and send the moths to him for identification (Pierce, 1918). It was amongst this material that he found *P. finitimella* after dissection of the genitalia. The discovery did not arouse much interest because concern with the microlepidoptera had to a large extent lapsed in Britain. Few collectors checked their specimens and Meyrick (1928) was able to give only the counties of Essex and Durham for the occurrence of *P. finitimella*. No attempt was made to look at the early stages to see if there were any differences and for another fifty years no further thought was given to the subject.

This was the situation I inherited in 1979 when *A Field Guide to the smaller British Lepidoptera* was written. My attempt to add useful information was disastrous, for I got it the wrong way round. I had recognised that there were two mine patterns, one of which seemed the more common. Understandably, in view of the history

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of the two species in Britain, I ascribed the commoner mine to *P. torquillella*.

It was not until 1980 that I began to make a serious study of the early stages of these moths for Volume 2 of *The Moths and Butterflies of Great Britain and Ireland*. I wrote the draft text of the Gracillariinae in the winter of that year and devoted my field work in 1981 to checking and embellishing what I had written. Consequently the information which follows has been well digested.

As the result of my research, I found that the species were readily distinguishable in their early stages and that these differed in their timing. Dr. M. R. Shaw had written to me in 1979 suggesting that *P. torquillella* was univoltine and this was confirmed by my observations in 1980-1981. It appears to have a long emergence period extending from the end of May until July. Larvae do not appear until mid July and continue through August and September. The resulting adults do not emerge until the following year (cf. Stainton's observations quoted above). It would be possible for the earliest moths to produce a generation which completes its cycle in the summer months but I have no evidence that this ever happens.

The larva of *P. torquillella* has two cloudy dark marks on its head, which are sometimes obsolete. Its body is pale yellowish green without contrasting pinacula, its prothoracic plate has the four black spots characteristic of the genus and the thoracic legs are colorous with the body.

P. finitimella, on the other hand, is definitely bivoltine. Moths of the first generation fly in late April and May. Larvae are then found in June and July which produce a second generation of adults in July and August. Larvae occur again in September and October and give rise to the overwintering pupae.

The larva of *P. finitimella* is very different. It has four well-defined black marks on its head as well as the prothoracic plate. Its body is grey with conspicuous paler pinacula which are obsolescent on the abdominal segments; it becomes much paler when full-grown, but still retains a hint of its grey colour. The thoracic legs are ringed black, appearing wholly black except under magnification.

There are no detectable differences in the mines in the sap-feeding phase (the first two instars). There are, however, distinctions in the third instar mine, when tissue-feeding begins after the change in mouth-parts and a spinneret has been developed. *P. finitimella* spins the lower cuticle more extensively, causing it to contract in a number of creases and draw the lower edges of the mine together; the lower cuticle becomes greenish grey, flecked darker. The mine is relatively long and narrow. *P. torquillella*, on the other hand, spins the lower cuticle lightly; the mine is only slightly arched and the cuticle has a single central crease and is white, at any rate in tenanted and newly vacated mines. The mine is relatively shorter and broader and is transparent when held up to the light. Because of the lighter spinning, the mine splits open more easily, and the old ruptured mines which are so much in evidence on blackthorn bushes in autumn are generally of this species. In my experience, fresh

mines are easily told apart, but the marks of distinction tend to become blurred with the passage of time and it may then be necessary to study the characters of a number of mines before being sure of the species. A complication is that in southern England both are abundant and mixed mines will almost always be found on the same bush.

With regard to distribution, *P. torquillella* has the wider range, extending to Scotland and Ireland. *P. finitimella* becomes scarce in northern England and Meyrick's record from Co. Durham is still the most northerly; it has not been reported from Scotland or Ireland. In the south one gets the impression that *P. finitimella* is the more plentiful, but this is probably because in autumn one sees two generations of its vacated mines as opposed to one of *P. torquillella*. When I was making records for Essex (Emmet, 1981), I had not mastered the differences and, as I admitted, I might have recorded *P. finitimella* as *P. torquillella* in some instances. I then recorded *P. torquillella* from 56 of the 57 10X10 km squares in the county but *P. finitimella* from only 9. In 1981 I have increased the number of squares for *P. finitimella* to 52 and confirmed *P. torquillella* in all of these. There is hardly a stand of blackthorn in the county in which I have not found both species, if I have had the chance to search at the right time of year. What is true for Essex probably holds for all other southern counties.

With the knowledge I now have, I would rewrite species 281 and 282 in the *Field Guide* as follows.

281 (1102) *P. finitimella* (Zell.)

O. 5-6; 8-9. On the under surface of a leaf of *Prunus spinosa* or *P. domestica*.

L. 6-7; 9-10. When young, in a gallery in the lower epidermis which leads into a small, *Phyllonorycter*-type blotch in which the lower cuticle turns greenish grey and is strongly contracted by internal spinning. Later feeds under the downwards-folded tip or edge of a leaf, making successively two or three such folds. Larva grey with paler pinacula; head with four black spots; thoracic legs ringed black.

P. 7-8; 9-4. In an orange-yellow cocoon spun under a narrowly folded leaf-edge or in leaf-litter.

I. 4-5; 7-8. Comes to light.

282 (1103) *P. torquillella* (Zell.)

O. 6-8. On the under surface of a leaf of *Prunus spinosa* or *P. domestica*.

L. 7-9. Mine differs from that of *P. finitimella* in being only slightly contracted by internal spinning and having the lower cuticle white. Larva pale yellow-green without conspicuous pinacula; head with two darkish spots; legs yellow-green.

P. 9-5. Similar to *P. torquillella*.

I. 5-7. Has a long emergence period.

Possessors of the *Field Guide* who do not have the interleaved edition may prefer to make less extensive changes. I suggest that the

first priority is to alter the last word of the second line of the "L" paragraph under *P. finitimella* from "less" to "more", and the second to amend the timing of the stages of *P. torquillella*.

References

- Emmet, A. M. (ed.), 1979. *A field guide to the smaller British Lepidoptera*, 271 pp. London.
- Emmet, A. M., 1981. *The smaller moths of Essex*, 158 pp. London.
- Ford, L. T., 1949. *A guide to the smaller British Lepidoptera*, 230 pp. London.
- Meyrick, E., 1928. *A revised handbook of the British Lepidoptera*, 914 pp. London.
- Morris, F. O., 1872. *A natural history of British moths*, 1-4. London.
- Pierce, F. N., 1917. Occurrence in England of *Parornix finitimella* Z., a species of Gracilariadae new to the British list. *Entomologist's mon. Mag.* 53: 9-10.
- Pierce, F. N., 1918. The Lepidoptera of an Essex garden. *Entomologist's Record. J. Var.* 30: 81-86.
- Stainton, H. T., 1850. On *Ornix melegripennella* and its allies; a group of Lepidoptera, family Tineidae. *Trans. ent. Soc. Lond.* (2) 1: 86-96.
- Stainton, H. T. *et al.*, 1864. *The natural history of the Tineina*, 8, vii, 315 pp., 8 col. pls. London.
- Zeller, P. C., 1850. Verzeichniss der von Herrn Jos. Mann beobachteten Toscanischen Microlepidoptera (Section 7). *Stettin. ent. Ztg.* 11: 139-162.

PAPILIO MACHAON L. (SWALLOWTAIL) FLOURISHING IN A N. NORFOLK LOCALITY, 1981. — The present year having been a poorer one for butterflies (at least in my district, S. E. London) than I have experienced for very long, it is some small consolation to be able to report that one of our threatened species, *P. machaon*, was quite common in a small area of a privately-owned fen in North Norfolk. On a very warm afternoon, 22 June, these splendid creatures — apparently at the height of their season, being in mint condition — were disporting themselves in the open flowery fen, often swooping and perching on various blossoms (mostly purple composites), their wings maintained in tremulous motion whilst feeding in the manner peculiar to their kind, and presenting an unforgettable spectacle. It was possible to have 6, if not 7, in view at a time, their territory seeming to be concentrated by the apparent restriction of the foodplant, hogs' fennel, to one spot in that part of the fen which we visited. The butterflies were not shy; in fact, one seemed bent upon trying to enter my net as I was stalking a fly, and had to be 'shooed' away! We learnt from the landowner that, so far as he knew, *machaon* has never been 'put down' there, but had been present from early times. — A. A. ALLEN.